



M-HEALTH, NEW PROSPECT FOR SCHOOL HEALTH EDUCATION THROUGH MOBILE TECHNOLOGIES AT LEBANESE SCHOOL

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Abstract. Supporting school health programs to improve the emotionally and physically health status of Lebanese students has never been more important. The use of mobile and wireless technologies to promote school health programs has the potential to transform the school health education and service delivery in Lebanon. This article explores the possibility of utilizing M-Health programs in Lebanese schools. The investigation goal is to provide baseline information to help school policy makers, administrators, and educators as they plan and implement coordinated school health programs which are designed to promote healthy behaviors among the Lebanese youth through the usage of mobile technology.

Keywords: E-Health, e-learning, Lebanon, M-Health, Mobile, School Health Education,

Introduction

With the increase of technology usage among young Lebanese, we are faced with a new style of life and new health challenges that are different from those of the past decades. Today, the health issues of young Lebanese are directly linked to the health-related behaviors they choose to adopt. Some of the behaviors have been alarming, for they can contribute to today's major causes of death; such as heart disease, cancer, and injuries. Some of these behaviors include: not being physically active, eating unhealthy food, staying long hours behind the computer or on cell phones, staying up way past their bed time, drinking alcohol and taking drugs, engaging in behaviors that can result in violence or unintentional injuries. Supporting school health programs to improve the emotionally and physically healthy status of Lebanese students has never been more important. Schools are the main avenue that we can use to reach Lebanese children, adolescents, and their families. Schools should play a vital role in establishing healthy behavior patterns among young people while enhancing academic performances.

The use of mobile and wireless technologies in schools has the potential to transform Lebanese school health educations. Many major factors are compelling this change, including: the urgent needs to improve school health programs in order to improve the emotionally and physically health status of Lebanese students, the swift development in mobile technologies and applications, and the wide spread of mobile technology among the Lebanese and particularly the young generation, and the low cost of mobile cellular networks. These factors bring up new prospects of the utilization of mobile health education and services into the existing schools.

This article explores and collects information of the possibility of utilizing M-Health in Lebanese schools. The investigation goal is to provide baseline information to school policy makers, administrators, and educators as they plan and implement coordinated school health policies and programs.

Lebanon

Lebanon is a small Eastern Mediterranean country with a geographical area of 10452 sq/ km and a population around 4,005,025, including 500,000 refugees from different nationalities, most being Palestinians (UNRWA, 2001). The country belongs to the upper-middle income group with a diversity of 18 religions. The population of the residents between the ages of 5 and 24 is (40.1%) of the total Lebanese population, (Table 1) (NHHEUS, 1999).

Table 1. Age structure of the population

AGE	%
0 - 4	8.0
5 - 14	20.0
14 - 24	20.1
24 - 44	29.4
45 - 64	15.1
> 65	7.2

Lebanon is a middle income country. The Lebanese civil war from 1975 to 1990 had a damaging effect on the economy of the country. Restructuring the Lebanese infrastructure started in the early 90's after the end of the civil war. In consequence, there was an increasing financial deficit and public debt resulting in the slowing of the financial growth on a national scale. Since 1999, there has been an increase in poverty with the rapidly increasing public debt and minimal growth effect (NHHEUS, 1999).

Health Education

The school health education helps empower individuality allowing students to make educated health decisions. Health education is "the process of assisting individuals... to make informed decisions about matters affecting their personal health and the health of others" (National Task Force on the Preparation and Practice of Health Educators, 1985). Today, school health education is seen as a comprehensive health curricula; it includes environmental health, physical health, social health, emotional health, intellectual health, and spiritual health (Donatelle, 2009).

School Health Education in Lebanon

The school health education has been integrated in the Lebanese public schools' educational curriculum since 1987, nevertheless the performance of this curriculum has never been evaluated, (GSHS, 2005). The Global School-based Student Health Survey (GSHS) recommended upgrading and developing the Lebanese School Health Program in the educational curriculum, to include the new curricula's objectives. Several objectives have been recommended by the GSHS as the result of the survey in respect with the growth and development of the pupils in order to enable them to practice the health rules leading to their physical, psychological, and mental development, (GSHS, 2005).

Health Risk Behaviors in Lebanon

The World Health Organization, in collaboration with the Ministry of Health and the Ministry of Education, conducted the Global School-based Student Health Survey (GSHS) in Lebanon in years 2005 and 2011, in order to evaluate the health risk behaviors and protective factors of children in grades 7, 8, and 9. The results of the survey indicated several areas of concern:

Alcohol Use

In 2005, GSHS revealed that 20% of the students had at least one drink containing alcohol in the month preceding the survey, and 13.6% of the students got drunk one or more times during their life. In 2011, the percentage of students whom have had at least one drink containing alcohol in the month

preceding the survey increased to 28.5%, and the percentage of students whom got drunk one or more times during their life is 21.1%, (Figure 2) (GSHS, 2005/11).

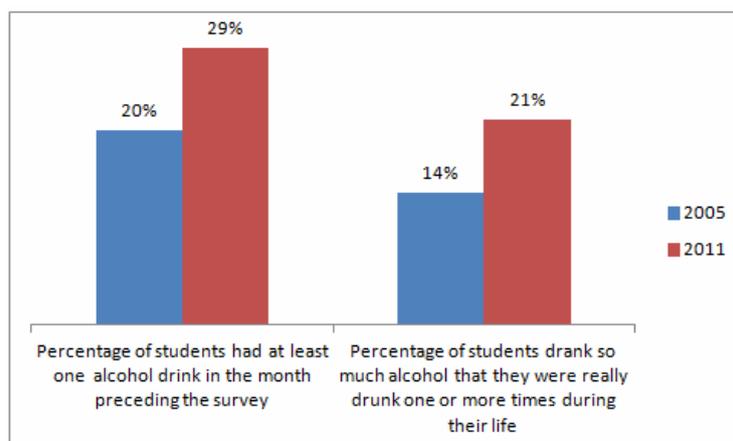


Figure 2. Alcohol use among 7, 8 and 9 grade students

Dietary Behaviors

In 2005, GSHS revealed that the percentage of overweight students is 23.3%, and 5% were obese. In 2011, the percentage of overweight students was 24.1% and 6.7% were obese, (Figure 3) (GSHS, 2005/11).

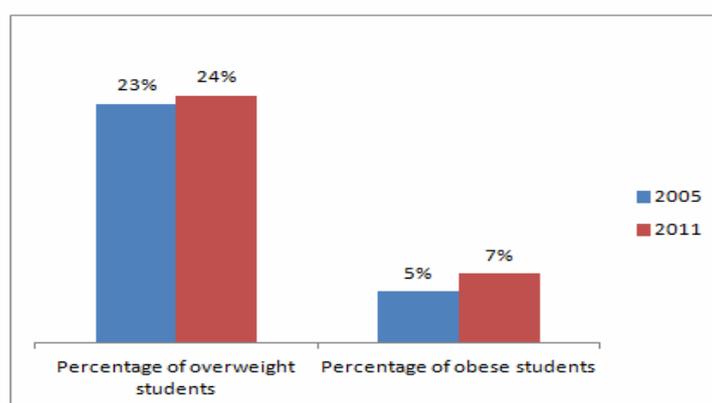


Figure 3. Dietary behaviors among 7, 8 and 9 grade students

Hygiene

In 2011, GSHS revealed that the percentage of students who usually cleaned or brushed their teeth less than one time per day during the past 30 days was 9.8% and 2.4% of students never or rarely washed their hands after using the toilet or latrine during the past 30 days, (Figure 4), (GSHS, 2011).

Mental Health

GSHS revealed that 15% of the students seriously considered committing suicide during the past 12 months and 3% of the students had no close friends, (Figure 5), (GSHS, 2011).

Physical Activity

Only 34.6% of the students were physically active for a total of at least 60 minutes per day on five or more days during the week preceding the survey and 33.1% of the students who went to physical education (PE) class on three or more days each week during the school year and 48.8% of the students spent three or more hours per day doing sitting activities, (Figure 6), (GSHS, 2011).

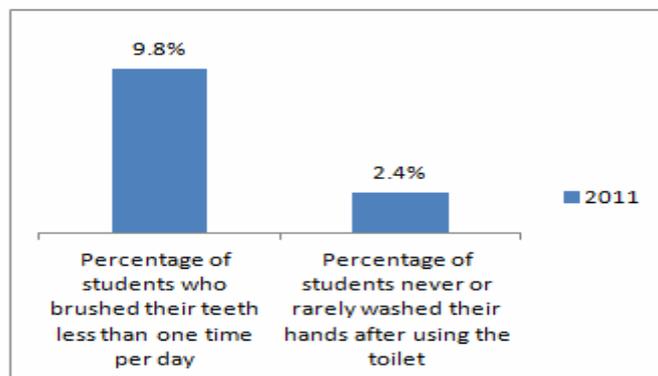


Figure 4. Hygiene: behaviors among 7, 8 and 9 grade students

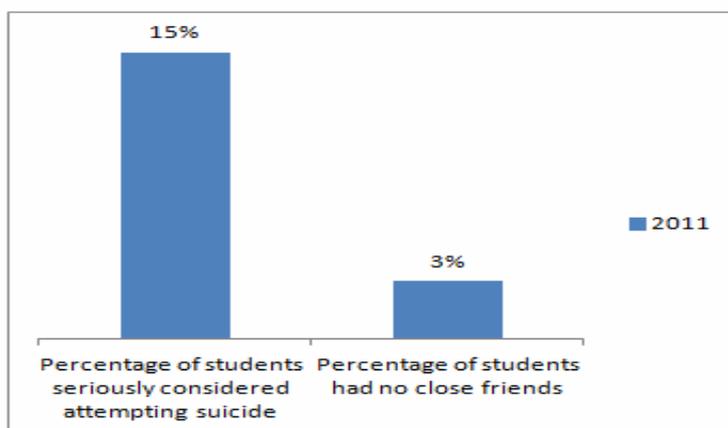


Figure 5. Mental health among 7, 8 and 9 grade students

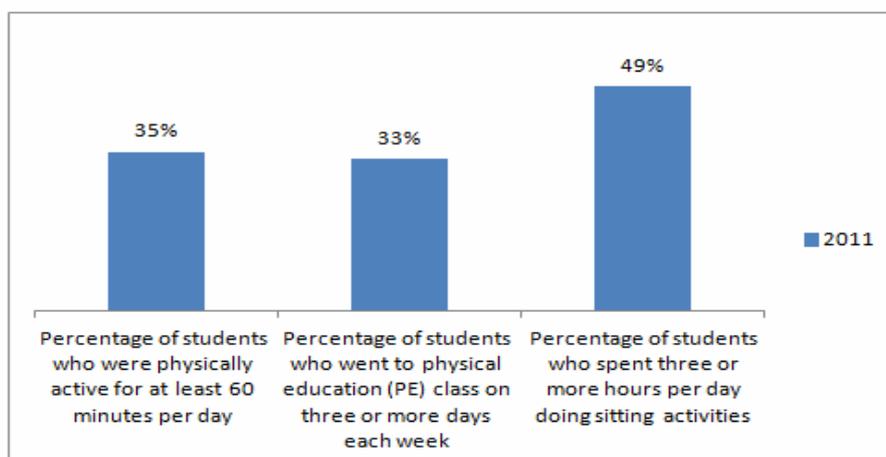


Figure 6. Physical activity among 7, 8 and 9 grade students

Protective Factors

17.5% of the students missed classes or school without permission for one or more times during the preceding 30 days before the survey, 47.8% of the parents or guardians of the students understood their children's problems and worries most of the time or always during the 30 days preceding the survey, and 53.5% of the students' parents or guardians really knew what their children were doing with their free time most of the time or always during the 30 days preceding the survey, (Figure 7), (GSHS, 2011).

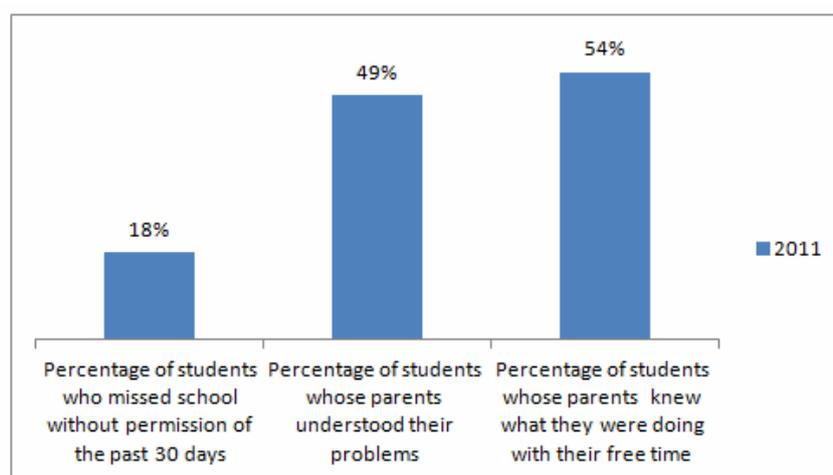


Figure 7. Protective factors among 7, 8 and 9 grade students

Violence and Unintentional Injury

48.5% of the students got involved in a physical fight one or more times during the past 12 months before the survey, 39% of the students were seriously injured one or more times during the past 12 months, and 25.1% of the students were bullied on one or more days during the past 30 days before the survey was taken, (Figure 8), (GSHS, 2011).

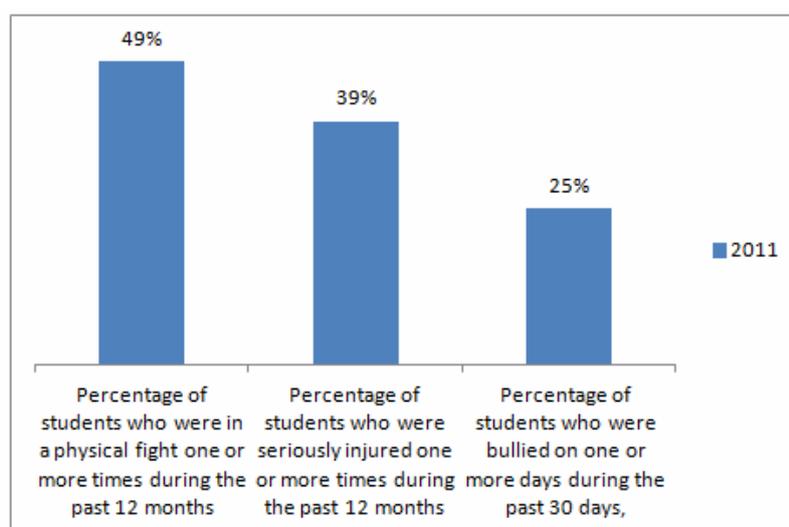


Figure 8. Violence and unintentional injury factors among 7, 8 and 9 grade students

Social Health

Lebanon has undergone many wars and political conflicts throughout its history. As a result, a large number of Lebanese have been exposed to war-related traumatic events at some point in their lives. Large numbers of Lebanese show signs of mental health disorders - primarily mood disorder and anxiety. A statistic done by The World Health Organization Assessment Instrument for Mental Health Systems revealed that 90% of the Lebanese with mental health disorders did not receive any treatment. More than 90% of mental health care are offered by the private sector and getting paid by the patients, (WHO-AIMS, 2010).

Social health care becoming increasingly overburdened by the cost, and not having enough staffs. According to the World Health Organization Assessment Instrument for Mental Health Systems, the total number of social health services provider per 100,000 populations is 15.1; among the 15.1 only 1.5 psychiatrists; 2.25 psychologists; 0.25 other medical doctors not specialized in psychiatry; 1.825

nurses; 0.5 social workers; 1.25 occupational therapists; and 7.5 other health or mental health workers per 100,000 population. And the number of professionals graduated in 2009 is as follows: 0.125 psychiatrists; 0.75 psychologists; 0.125 social workers per 100,000 populations. And between 1-20% of psychiatrists immigrate to other countries within five of the completion of their training. In terms of support for child and adolescent health, 1% of primary and secondary schools have social health professional, and a few schools (between 1-20%) have school-based activities to promote Social health and prevent mental disorders, (Figure 9), (WHO-AIMS, 2010).

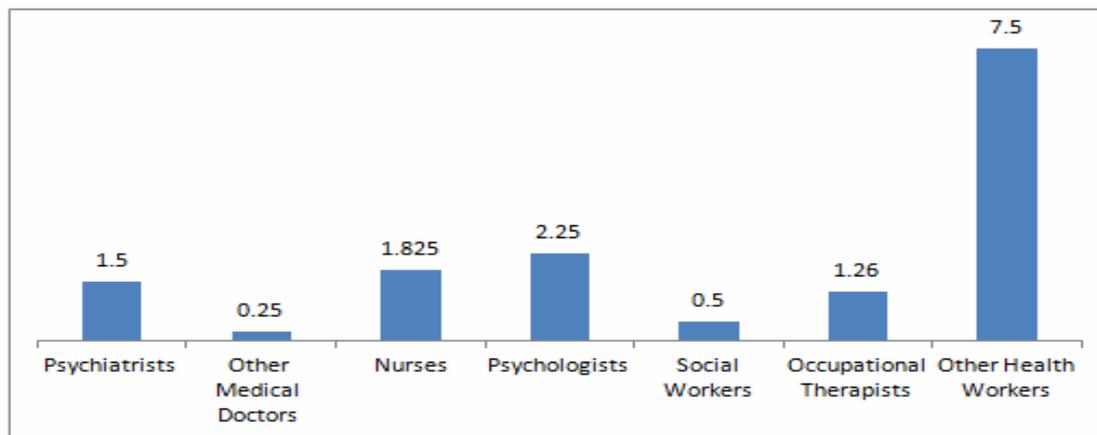


Figure 9. Human resources in Mental Health (rae per 100000 population)

Telecommunications sector in Lebanon

In June 2011, the United Nations declared that access to the Internet was a fundamental human right.

With the improvement of mobile phone networks and the decrease in prices, the number of mobile phone subscribers witnessed a significant increase in 2012. Between 2009 and 2012, the Ministry of Telecommunications engaged in massive investments, in order to modernize the mobile networks - Fiber Optic and 3G. These initiatives have started to bear measurable results. Speed has improved by 18 times on the mobile networks. Internet prices for companies and private individuals have decreased by 80%. On August 23, 2011, the Council of Ministers approved a decree aimed at reducing the prices of the Internet and of the international leased lines used by companies by an average of 80%. Educational institutions would benefit from an additional 20% reduction. The number of Mobile Broadband subscribers has risen by 158% in the last year. According to the Lebanese Ministry of Telecommunications, in June 2012, there were nearly 3.6 million Lebanese – i.e. 85.4% of the population has a mobile phone in use, which places Lebanon above the developing countries average of 78.8%, (One Year Progress Report, 2012).

Adoption of the 3/4G+

In October 2011, the Ministry of Telecommunications launched the third generation (3G) mobile phone services. The Lebanese were greatly enthusiastic about 3G; in 11 months, the number of users increased by 158% in May 2012. In July 2012, Touch network already consisted of 5,612 antennas and 15 mobile stations, while Alfa's had 4,505 antennas and 15 mobile stations.

In May 2013, the Ministry of Telecommunications launched the fourth generation (4G) mobile phone services.

Free Internet in Public Gardens

Ministry of Telecommunications launched a program to provide all public gardens in the country with a free Wifi service. So far, 3 public gardens have been provided with the service: - Sanayeh- René Mouawad in Beirut (22,000 m²), Sioufi in Beirut (20,000 m²), and Manchiyah in Tripoli (10,000 m²). Public gardens in the country with Wifi under installation: Jezzine (3,200 m²), Kadri in Zahle (4,500

m²), The Jesuites garden, Yassou3iyé in Beirut (4,400 m²), Saint Nicolas garden in Beirut (2,200 m²), Talet el Khayat , and Moufti Hassan Khaled (5,000 m²). Public gardens in the country with Wifi expected, pending funding: Zouk Mikhaél (2,950 m²), Ballouneh (6,550 m²), Burj Hammoud (1,623 m²), The Istiraha of Saïda (20,000 m²). Public gardens on the waiting list: Baaklin (10,000 m² out of a total surface area of 40,000 m²), Herch Beirut (30,000 m²) of the total surface area of 330,000 m², Bourj Abi Haidar (7,000 m²), and Fih (20,000 m²), (One Year Progress Report, 2012).

Incentives for Educational Institutions

Educational institutions benefited since October 2011 from a 20% discount on the DSL subscriptions. In August 2012, the Ministry of Telecommunications, in partnership with the Ministry of Education and mobile phone operator Alfa, allowed the 19,000 Brevet (9th Grade) and Lebanese Baccalaureate students to attain their exams grades through SMS, free of any additional charge other than the usual cost of the SMS. This initiative illustrates a successful collaboration among Ministries, (One Year Progress Report, 2012).

Security Awareness: The Ministry of Telecommunications launched in October 2012, a project aimed to raise awareness among youth and parents regarding security on the Internet. The project will raise awareness among youth of the risks they may come across surfing the net; and encourage them to assume responsible activities on the web, (One Year Progress Report, 2012).

Tablets in schools. The Ministry of Education is planning to bring technologies drastic change in teaching methods by replacing books with. The Ministry of Telecommunications is collaborating with the Ministry of Education in order to accomplish this goal. Accordingly, the first stage of the project will give the Ministry of Education the 1,500 tablets that are necessary for implementation the pilot stage, (One Year Progress Report, 2012).

Discussion

Today we are faced with a new style of life and new health challenges that are different from those of the past decades. Today, the health issues of young Lebanese are directly linked to the health-related behaviors they choose to adopt. Some of the behaviors and trends have been alarming for they can contribute to today's major causes of death; such as heart disease, cancer, and injuries. The data indicated several behaviors concerning 7th, 8th, and 9th grades students. These data include: Using alcohol (29%), overweight or obese (31%), low hygiene (10%), poor mental health (15%), not being physically active (49%), and engaging in behaviors that can result in violence or unintentional injuries (49%). Supporting school health programs to improve the emotionally and physically healthy status of Lebanese students has never been more important.

Schools are the main channel which we can utilize to reach more than 41% of the Lebanese population every school day. Schools should play a vital role in establishing healthy behavior patterns among Lebanese. The use of mobile and wireless technologies to promote school health education has the potential to transform the school health education and service delivery in Lebanon.

Lebanon is experiencing a surprising phenomenon of the exponential growth of mobile communications. Mobile technology is overcoming conventional communicating systems and is permitting users to communicate across wide geographical regions. In Lebanon the number of mobile subscribers has risen by 158% in 2012. According to the Lebanese Ministry of Telecommunications, in June 2012, there were nearly 3.6 million Lebanese – i.e. 85.4% of the population – having a mobile phone in use. This places Lebanon above the developing countries' average of 78.8%, (One Year Progress Report, 2012).

The rise of mobile broadband through 4G innovation will increase the number of Lebanese that can access Internet through mobile, particularly in isolated areas, where inadequate infrastructure makes access to the Internet difficult. The growing sophistication of these networks, offering higher and higher speeds of data transmission alongside cheaper and more powerful handsets, helps us capture the opportunity to utilize the potential of mobile technologies to transforming the way health services and

information are accessed, delivered, and managed. With the increased accessibility comes the opportunity of personalization-focused school health programs.

School M-health program field is where students, staff, and parents can be connected to services which include health information on demand, health record management, and the remote, real-time monitoring of chronic conditions such as diabetes, asthma, hypertension and many others. Mobile technologies have already changed and will continue to change the lives of millions of Lebanese. Many are calling this change a revolution. Lebanese should take advantage of the development that mobile technologies offer at fairly low prices. Many countries are making use of mobile technologies in their health services by progressively sophisticated ways. The majority of countries are offering health call and emergency services using mobile communications. Yet the health sector in Lebanon has not adopted mobile technologies which would benefit the health of young generation and the Lebanese in general.

The usage of mobile technology to address health needs is a dynamic field. The vast mobile applications that are being designed are continually expanding. The main mobile applications for M-Health can include the following components:

1. Health Education Curriculum which addresses the physical, mental, emotional, and social dimensions of health
2. Managing emergencies and disasters rising over health issues
3. Communication between individuals and health services
 - i. Health call centers, telephone help line for School Counseling, and Psychological and Social Services
 - ii. Emergency telephone services
 - iii. Appointment reminders
4. Decision support systems
5. Consultation between health care professionals- Mobile telemedicine
6. Communication and training for healthcare workers
7. Health monitoring and data collection
 - Mobile surveys (surveys by mobile phone)
 - Surveillance
 - Patient monitoring
8. Access to information of health care professionals
 - Information and decision support systems
 - Patient records
9. School and Parent/Community Involvement that establishes and promotes collaborative efforts not only within schools but with parents, business, and others interested in the health outcomes of students.

Summary

School health programs in Lebanon are under increasing pressure to perform under multiple challenges; including chronic staff shortages and limited budgets which are among the most important barriers of the schools' adoption of school health education. The finding shows a strong ground that we can use to improve school health programs using mobile communications. M-Health programmers require low cost infrastructure and less staff. Creating School M-Health Education will help countries align school health programs and activities with health priorities and targets to be realized. The information generated from this article is an invaluable resource for the development of a policy framework and strategy that aims to identify and strengthen the priority of school health programs and promote an environment to facilitate the overcoming of any obstacles that may occur.

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